

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY

LETTER
CIRCULAR
LC 974

STANDARD FREQUENCIES AND TIME SIGNALS, WWV AND WWVH

STANDARD RADIO FREQUENCIES
STANDARD TIME INTERVALS

TIME ANNOUNCEMENTS
STANDARD MUSICAL PITCH

STANDARD AUDIO FREQUENCIES
RADIO PROPAGATION NOTICES

WWV		
BROADCAST CONTINUOUSLY		
Mc	POWER, Kw	MODULATIONS, c/s
2.5	0.7	1, 440 or 600
5	8.0	1, 440 or 600
10	9.0	1, 440 or 600
15	9.0	1, 440 or 600
20	8.5*	1, 440 or 600
25	0.1	1, 440 or 600
30	0.1	1
35	0.1	1

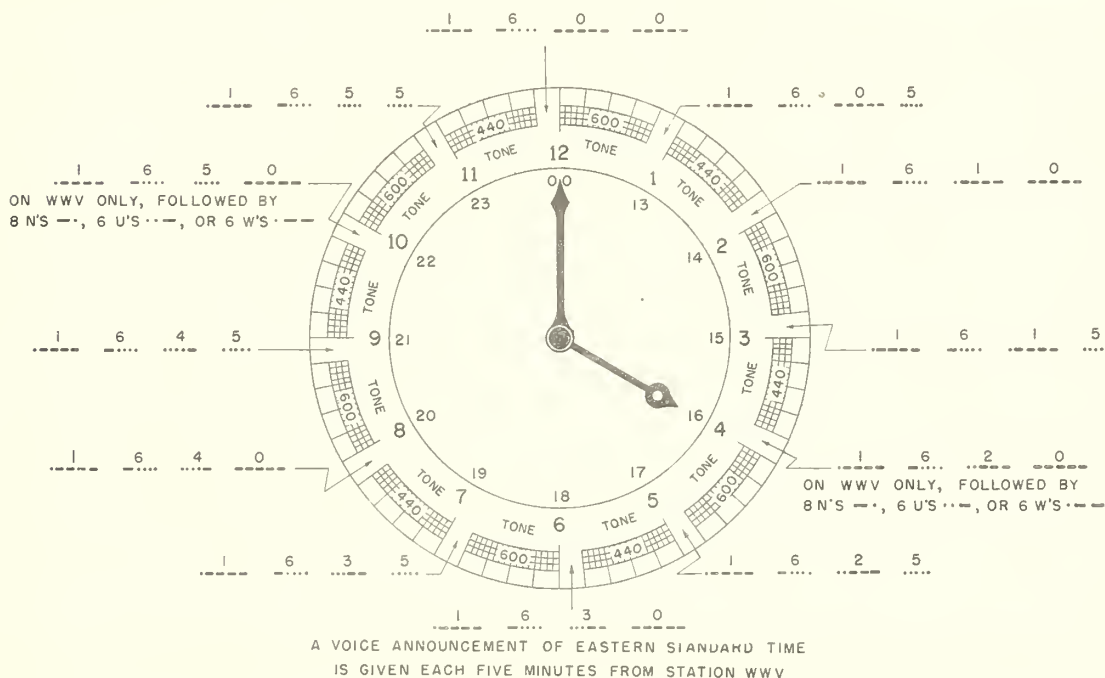
WWVH		
BROADCAST CONTINUOUSLY **		
Mc	POWER, Kw	MODULATIONS, c/s
5	0.4	1, 440 or 600
10	0.4	1, 440 or 600
15	0.4	1, 440 or 600

*0.1 Kw, FOR FIRST 4 WORK DAYS AFTER
FIRST SUNDAY OF EVEN MONTHS.

**REGULAR INTERRUPTIONS EXPLAINED
ON REVERSE SIDE.

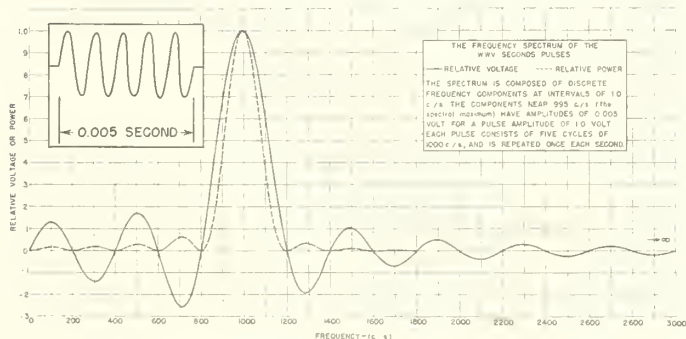
THE HOUR ILLUSTRATED IS 1600 TO 1700 IN 24 HOUR TIME

UNIVERSAL TIME

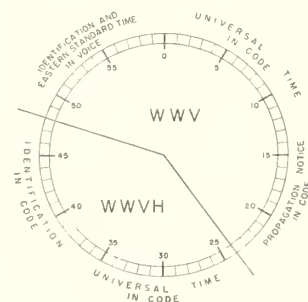


SECONDS PULSE

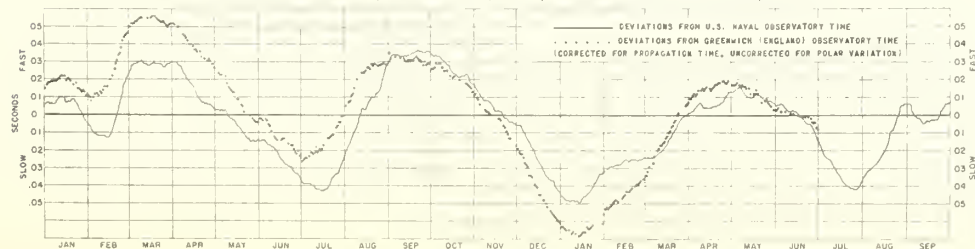
(NO PULSE IS TRANSMITTED AT THE BEGINNING OF THE LAST SECOND OF EACH MINUTE)



ONE-MINUTE ANNOUNCEMENT INTERVALS



WWV TIME SIGNALS, JANUARY, 1948, THROUGH SEPTEMBER, 1949



order payable to the "Superintendent of Documents, Government Printing Office" and sent to him with the order. Postage stamps should not be sent in payment for these publications.

The publications on plastics are grouped in this Letter Circular into the following classifications:

General
Government
Home Crafts
Formulas
Technology
Properties
Test Methods
Chemistry
Adhesives
Coatings
Periodicals
Industry

GENERAL

1. PLASTICS. J. H. DuBois. 3rd edition. 1945. American Technical Society, Drexel Ave. at 58th St., Chicago 37, Ill. \$5.00.
2. PRODUCTION AND PROPERTIES OF PLASTICS. S. L. Kaye. 1947. International Textbook Co., Scranton 9, Pa. \$5.00.
3. HOW TO BUY AND SELL PLASTICS. Laura E. Morrison. 1948. Plastic Materials Manufacturers' Association, Inc., 731 Tower Bldg., Washington 5, D. C. 25 cents.
4. FUNDAMENTALS OF PLASTICS. H. M. Richardson and J. W. Wilson. 1946. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. \$4.00.
5. MEET THE PLASTICS. C. N. Robinson. 1949. The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. \$3.75.
6. PLASTICS IN PRACTICE. J. Sasso and M. A. Brown, Jr. 1948. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. \$4.50.
7. INDUSTRIAL PLASTICS. Herbert R. Simonds. 3rd edition. 1945. Pitman Publishing Corp., 2 W. 45th St., New York 19, N. Y. \$5.00.

The encyclopedia listed in reference 53 is also a source of general information on the materials, processes, and equipment employed in the plastics industry, and contains charts of the properties of plastics, solvents, plasticizers, synthetic rubbers, adhesives, coatings, and fibers.

GOVERNMENT

8. CENSUS OF MANUFACTURES - 1947. MC28B. INDUSTRIAL ORGANIC CHEMICALS. U. S. Department of Commerce, Bureau of the Census. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 10 cents. Includes statistics on the plastic materials industry for employment, pay rolls, value added by manufacture, value of shipments, cost of raw materials, expenditures for plants and equipment, and materials manufactured.
9. CENSUS OF MANUFACTURES - 1947. MC39D. PLASTICS PRODUCTS; MISCELLANEOUS MANUFACTURES. U. S. Department of Commerce, Bureau of the Census. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 10 cents. Includes statistics for the plastics products industry similar to those listed for materials in reference 8.
10. PLASTICS MATERIALS (BASIC INFORMATION SOURCES). U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington 25, D. C. Free.
11. BIBLIOGRAPHY OF REPORTS ON PLASTICS. SB-3. U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C. Free.
12. EMPLOYMENT OUTLOOK IN THE PLASTICS PRODUCTS INDUSTRY. U. S. Department of Labor, Bureau of Labor Statistics Bulletin No. 929. 1948. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 15 cents.
13. PLASTICS PRODUCTS. U. S. Tariff Commission. War Changes in Industry Series Report No. 28. 1948. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 25 cents.
14. SYNTHETIC PLASTICS AND RESIN MATERIALS. Facts for Industry Series 6-10-1C. U. S. Tariff Commission, Washington 25, D. C. Free. Monthly preliminary reports on production and sales.

15. SYNTHETIC ORGANIC CHEMICALS, UNITED STATES PRODUCTION AND SALES (PRELIMINARY). U. S. Tariff Commission, Washington 25, D. C. Free. Annual preliminary reports on plastic materials, plasticizers, and elastomers.
16. SYNTHETIC ORGANIC CHEMICALS, UNITED STATES PRODUCTION AND SALES, 1948. U. S. Tariff Commission Report No. 164, Second Series. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 40 cents.
17. FEDERAL SPECIFICATIONS INDEX. General Services Administration, Bureau of Federal Supply. Revised to January 1, 1949. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 40 cents.
18. UNITED STATES ARMY INDEX OF SPECIFICATIONS. Department of the Army. January 1, 1949. Superintendent of Documents, Government Printing Office, Washington 25, D. C. \$1.50.

HOME CRAFTS

19. PLASTIC ARTS CRAFTS. J. V. Adams. 1948. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. \$2.75.
20. GENERAL PLASTICS. R. Cherry. 1941. McKnight and McKnight, 109-111 W. Market St., Bloomington, Ill. \$1.50.
21. MOLDING AND CASTING. C. D. Clarke. 1946. The Standard Arts Press, 2635 N. Calvert St., Baltimore 18, Md. \$6.50.
22. PLASTIC CRAFT. E. S. De Wick and J. H. Cooper. 1946. Macmillan Co., 60 Fifth Ave., New York 11, N. Y. \$5.00.
23. WORKING WITH PLASTICS. Arthur Dunham. 1948. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. \$3.50.
24. PRESERVATION OF AGRICULTURAL SPECIMENS IN PLASTICS. G. R. Fessenden. U. S. Department of Agriculture Miscellaneous Publication No. 679. 1949. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 25 cents.

25. PLASTICS IN THE SCHOOL AND HOME WORKSHOP. A. J. Lockrey.
3rd edition. 1946. D. Van Nostrand Co., Inc., 250
Fourth Ave., New York 3, N. Y. \$3.50.
26. PLASTICS--PROBLEMS AND PROCESSES. D. E. Mansperger and
C. W. Pepper. 2nd edition. 1942. International
Textbook Co., Scranton 9, Pa. \$2.50.
27. ADVENTURES WITH PLASTICS. L. V. Newkirk, G. Hewitt, and
L. Zutter. 1947. D. C. Heath and Co., 180 Varick
St., New York 14, N. Y. \$3.50.

FORMULAS

28. THE 1948 CHEMICAL FORMULARY. H. Bennett. Chemical Pub-
lishing Co., Inc., 26 Court St., Brooklyn 2, N. Y.
\$7.00.
29. HENLEY'S TWENTIETH CENTURY BOOK OF FORMULAS, PROCESSES,
AND TRADE SECRETS. G. D. Hiscox. 1942. Norman W.
Henley Publishing Co., 17 W. 45th St., New York 19,
N. Y. \$4.00.

TECHNOLOGY

30. GERMAN PLASTICS PRACTICE. J. M. DeBell, W. C. Goggin, and
W. E. Gloor. 1946. DeBell and Richardson, Hazard-
ville, Conn. \$7.50.
31. PLASTICS IN ENGINEERING. J. Delmonte. 3rd edition. 1949.
Penton Publishing Co., 1213 W. 3rd St., Cleveland 13,
Ohio. \$10.00.
32. LOW-PRESSURE LAMINATING OF PLASTICS. J. S. Hicks. 1947.
Reinhold Publishing Corp., 330 W. 42nd St., New York 18,
N. Y. \$4.50.
33. TECHNOLOGY OF PLASTICS AND RESINS. J. P. Mason and J. F.
Manning. 1945. D. Van Nostrand Co., Inc., 250
Fourth Ave., New York 3, N. Y. \$6.50.
34. CELLULOSE AND CELLULOSE DERIVATIVES. Emil Ott. 1943.
Interscience Publishers, Inc., 215 Fourth Ave., New
York 3, N. Y. \$15.00.

35. CASEIN AND ITS INDUSTRIAL APPLICATIONS. E. Sutermeister and F. L. Browne. 1939. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. \$6.50.
36. PLASTICS THEORY AND PRACTICE. C. C. Winding and R. L. Hasche. 1947. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. \$3.50.

PROPERTIES

37. MECHANICAL BEHAVIOR OF HIGH POLYMERS. T. Alfrey, Jr. High Polymers Series, Vol. VI. 1948. Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. \$9.50.
38. PLASTICS PROPERTIES CHART. Published annually in Modern Plastics Encyclopedia. (See reference 52).
39. HANDBOOK OF PLASTICS. H. R. Simonds, A. J. Weith, and M. H. Bigelow. 1949. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. \$25.00.
40. TECHNICAL DATA ON PLASTICS. 1948. Plastic Materials Manufacturers' Association, Inc., 731 Tower Bldg., Washington 5, D. C. \$2.50.
41. SPI HANDBOOK. 1947. Society of the Plastics Industry, 295 Madison Ave., New York 17, N. Y. \$7.50.

TEST METHODS

42. A.S.T.M. STANDARDS ON PLASTICS. Sept. 1948. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. \$4.50.
43. FEDERAL SPECIFICATION L-P-406a FOR PLASTICS, ORGANIC; GENERAL SPECIFICATIONS, TEST METHODS. Jan. 24, 1944. Amendment-1, Apr. 15, 1949. Superintendent of Documents, Government Printing Office, Washington 25, D. C. 15 cents.

CHEMISTRY

44. THE CHEMISTRY OF SYNTHETIC RESINS. Carleton Ellis. 1935. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. \$22.50.

45. THE CHEMISTRY OF COMMERCIAL PLASTICS. R. L. Wakeman. 1947. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. \$10.00.

ADHESIVES

46. A.S.T.M. STANDARD ON ADHESIVES. 1947. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. \$1.25.
47. THE TECHNOLOGY OF ADHESIVES. J. Delmonte. 1947. Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. \$8.00.
48. MODERN WOOD ADHESIVES. T. D. Perry. 1944. Pitman Publishing Co., 2 W. 45th St., New York 19, N. Y. \$3.00.

COATINGS

49. PROTECTIVE AND DECORATIVE COATINGS. J. J. Mattiello. 1945. Superintendent of Documents, Government Printing Office, Washington 25, D. C. \$1.25.

PERIODICALS

50. JOURNAL OF POLYMER SCIENCE. Monthly magazine. Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N.Y. \$15.00 per year.
51. MODERN PLASTICS. Published monthly. Modern Plastics, Inc., 122 E. 42nd St., New York 17, N. Y. \$5.00 per year.
52. MODERN PACKAGING ENCYCLOPEDIA. Published annually. Packaging Catalog Corp., 122 East 42nd St., New York 17, N. Y. \$5.00.
53. MODERN PLASTICS ENCYCLOPEDIA. Published annually. Plastics Catalogue Corp., 122 E. 42nd St., New York 17, N. Y. \$5.00.
54. PLASTICS BUYER. Published annually. Cleworth Publishing Co., Inc., 551 Fifth Ave., New York 17, N. Y. \$3.00.
55. PLASTICS INDUSTRY. Published monthly. Miller Freeman Publications of California, 170 Lexington Ave., New York 17, N. Y. \$3.00 per year.

56. PLASTICS WORLD. Published monthly. Cleworth Publishing Co., Inc., 551 Fifth Ave., New York 17, N. Y. \$3.00 per year.

INDUSTRY

57. BAKELITE REVIEW. Published quarterly. Bakelite Division, Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N. Y.
58. CELANESE PLASTICS. Published monthly. Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.
59. DOW DIAMOND. Published bimonthly. Dow Chemical Co., Midland, Mich.
60. DU PONT PLASTICS BULLETIN. Published quarterly. E. I. du Pont de Nemours and Co., Polychemicals Dept., Arlington, N. J.
61. DUREZ PLASTIC NEWS. Published monthly. Durez Plastics and Chemicals, Inc., 8 Walck Rd., North Tonawanda, N. Y.
62. FORMICA WORLD. Published quarterly. Formica Co., 4614 Spring Grove Ave., Cincinnati 32, Ohio.
63. HERCULES CHEMIST. Published quarterly. Hercules Powder Co., 916 Market St., Wilmington 99, Del.
64. MONSANTO MAGAZINE. Published monthly. Monsanto Chemical Co., Department of Industrial and Public Relations, 1700 S. Second St., St. Louis 4, Mo.
65. PLASKON MAGAZINE. Published quarterly. Plaskon Div., Libbey-Owens-Ford Glass Co., 2112 Sylvan Ave., Toledo 6, Ohio.
66. PLASTICS NEWSFRONT. Published monthly. American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York 20, N. Y.
67. ROHM AND HAAS REPORTER. Published bimonthly. Rohm and Haas Co., 222 W. Washington Sq., Philadelphia 5, Pa.